news at CIRM

STEM CELLS MOVE TOWARD CLINICAL TRIALS

In naming Proposition 71 the California Stem Cell Research and Cures Act its authors emphasized the goal of delivering life-saving regenerative medical treatments and cures to the people of California and the world. This past year brought considerable progress toward that goal.

The most significant advancement was the announcement that Geron's therapy for spinal cord injury based on embryonic stem cells would begin enrolling new patients. Soon after, two additional trials based on embryonic stem cells joined Geron with approval to begin trials.

Early Progress Toward the Clinic

THREE OF THE 14 disease teams awarded in October 2009 have already achieved major milestones. At the University of Southern California, Paula Cannon, who is working with the team headed by John Zaia of City of Hope, has published a proof of principle paper on the team's effort to create blood-forming stem cells that can produce HIV-resistant T cells. Her team showed that in mice, genetically modified human blood-forming stem cells were able to form a new blood system that could control HIV infection.

"This hybrid of gene and stem cell therapy shows that it is possible to create HIV-resistant immune cells that can eventually win the battle against HIV," said Cannon in a USC press release.

Karen Aboody, also of City of Hope, received Food and Drug Administration approval in June to begin a clinical trial with neural stem cells that act as carriers for an enzyme that converts a pro-drug to an active cancer chemotherapeutic agent. While the FDA approval came for a different agent and a different protocol than the one she has proposed for the CIRM disease team, the cell type is the same, and this should greatly speed approval of the CIRM-funded clinical trial application. The CIRM regimen uses a more powerful

More Candidates for Cures

AS THE DISEASE team projects grow closer to human clinical trials, CIRM continues to fund new work in the earliest stages of that pathway. CIRM's Early Translation II Awards fund the transition of a basic discovery about a disease into a drug or therapy that could eventually benefit patients.

This year, the awards came in two categories: One funds all the steps needed to produce a drug candidate worthy of costly pre-clinical testing. The other, a Feasibility Award, funds one or two of those steps that move the research further down the pipeline but not to the point of a drug candidate.

Altogether the CIRM Governing Board issued awards for $71 million in grants for 21 Early Translational II Awards making a total of 37 Early Translation Awards to date.

"We are looking for ways to complement our leading edge of stem cell-based treatments for patients and these projects will load our frontline portfolio with promising studies on autism, muscular dystrophy, Canavan disease and liver disease," said CIRM president Alan Trounson. "These projects will enhance the potential medical options available for patients and hopefully in the near future produce cures for such debilitating handicaps and diseases."

The awards cover a broad spectrum of diseases. Some award recipients are looking for alternative paths to the clinic for diseases such as HIV and brain tumors, which are already under investigation by CIRM grantees. Others address conditions and injuries new to CIRM's drug candidate portfolio, including degenerative bone conditions (see sidebar), blindness and autism.

One award went to University of California, San Diego scientist Alysson Muotri, who will be following up on her initial work developing a model for understanding and treating forms of autism (see Understanding Autism p. 22).

Treating Osteoarthritis

Forty million Americans live with constant pain caused by degeneration of the cartilage in the joints or osteoarthritis. Their only hope for pain relief comes from costly surgery to entirely replace the joint. • One of the Early Translation II projects at the Scripps Research Institute aims to provide an alternative to surgery. The plan is to activate a patient's mesenchymal stem cells within the joint to form new cartilage and prevent further damage. • The team has already tested compounds on stem cells in a lab dish to find ones that promote new cartilage and that protect existing cartilage from additional damage. With their CIRM award, they now hope to develop a promising drug candidate to protect and restore cartilage, and give hope to the 1.8 million people predicted to need joint replacements in 2015.

chemotherapeutic agent.

A third team, led by Stanford's Irv Weissman, is developing an antibody-based drug to treat leukemia. The drug binds to a protein that leukemia stem cells use to avoid being ingested and removed by the body's immune system. This protein is found on some other cancer stem cells, including those for non-Hodgkins lymphoma. The team has reported that a test drug could cure non-Hodgkins in mice in 60 percent of cases.

The Disease Team Awards required teams including basic scientists and clinicians from both industry and academia to show a roadmap for getting to clinical trials in four years. These collaborations speed the process of establishing clinical trials by ensuring that clinically relevant issues are considered early and by avoiding safety issues being discovered late in the process.